Subject. تکلیف شماره ۳۰ | یازدهم تیر B | اسیه محمد مجتبایی

۱) $\lim_{x\to 1} \dfrac{4x^2-7x+3}{5x^2-8x+3} = \dfrac{0}{0} =$ حذف عامل صفر کننده $= \dfrac{(4x-3)\cancel{(x-1)}}{(5x-3)\cancel{(x-1)}} = \boxed{\dfrac{1}{2}}$

۲) $\lim_{x\to 0} \dfrac{|3x-1| - |3x+1|}{x} = \dfrac{0}{0}$

به ازای همه قدر مطلق اول منفی و قدر مطلق دوم مثبت است.

$\dfrac{-3x+1-3x-1}{x} = \dfrac{-6x}{x} = \boxed{-6}$

۳) $\lim_{x\to 4} \dfrac{x-4}{\sqrt{x}-2} = \dfrac{0}{0} \Rightarrow \dfrac{x-4}{\sqrt{x}-2} = \dfrac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{(\sqrt{x}-2)}} = \boxed{4}$

۴) $\lim_{x\to 2} \dfrac{x-\sqrt{2x}}{2x^2-x-6} = \dfrac{0}{0} \Rightarrow \dfrac{x-\sqrt{2x}}{(2x+3)(x-2)} \times \dfrac{x+\sqrt{2x}}{x+\sqrt{2x}} = \dfrac{x^2-2x}{(2x+3)(x-2)(x+\sqrt{2x})}$

$= \dfrac{x\cancel{(x-2)}}{(2x+3)\cancel{(x-2)}(x+\sqrt{2x})} = \dfrac{\cancel{2}}{(7)(\cancel{2}4)} = \boxed{\dfrac{1}{14}}$

۵) $\lim_{x\to 1} \dfrac{1-\sqrt{x}}{2-\sqrt{5-x}} = \dfrac{0}{0} \Rightarrow \dfrac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \dfrac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \dfrac{(1-\sqrt{x})(2+\sqrt{5-x})}{4-5+x}$

$\dfrac{(1-\sqrt{x})(2+\sqrt{5-x})}{-(1-x)} = \dfrac{\cancel{(1-\sqrt{x})}(2+\sqrt{5-x})}{-\cancel{(1-\sqrt{x})}(1+\sqrt{x})} = \dfrac{4}{-2} = \boxed{-2}$

۶) $\lim \dfrac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \dfrac{0}{0} \Rightarrow$

$\dfrac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \dfrac{\sqrt{3x+4}+4}{\cancel{\sqrt{3x+4}+4}\ 8} \times \dfrac{\cancel{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}\ 27}{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}$

$\dfrac{3x+4-16}{5x+7-27} \times \dfrac{27}{8} = \dfrac{3\cancel{(x-4)}}{5\cancel{(x-4)}} \times \dfrac{27}{8} = \boxed{\dfrac{81}{40}}$

Subject.

$$\lim_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}=\frac{0}{0}$$ (7

$$\Rightarrow \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\times\frac{\sqrt{3x+\sqrt{x}}+2}{\cancel{\sqrt{3x+\sqrt{x}}+2}}\times\frac{\cancel{\sqrt[3]{x^2}+1+\sqrt[3]{x}}}{\sqrt[3]{x^2}+1+\sqrt[3]{x}}=$$

$$\frac{3x+\sqrt{x}-4}{x-1}\times\frac{3}{4}=\frac{\cancel{(\sqrt{x}-1)}(3\sqrt{x}+4)}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}\times\frac{3}{4}=\frac{7}{2}\times\frac{3}{4}=\boxed{\frac{21}{8}}$$

$$\lim_{x\to\pi}\frac{1+\cos^3 x}{\sin^2 x}=\frac{0}{0}$$ فیل و فنجون (8

$\sin^2 x \to 1-\cos^2 x$

$$\Rightarrow\frac{(1+\cos x)(1+\cos^2 x-\cos x)}{(1-\cos^2 x)}=\frac{\cancel{(1+\cos x)}(3)}{(1-\cos x)\cancel{(1+\cos x)}}=\boxed{\frac{3}{2}=1/5}$$

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}$$ (9

$$\frac{\frac{\cos x}{\cos x}-\frac{\sin x}{\cos x}}{\sin x-\cos x}=\frac{\frac{-(\sin x-\cos x)}{\cos x}}{\sin x-\cos x}=\frac{-\cancel{(\sin x-\cos x)}}{\cos x\cancel{(\sin x-\cos x)}}$$

$$=\frac{-1}{\cos x}=\frac{-1}{\frac{\sqrt{2}}{2}}=-\frac{2}{\sqrt{2}}=\boxed{-\sqrt{2}}$$

$$\lim_{x\to\frac{3\pi}{4}}\frac{[illegible]-1}{\cos 2x}=\frac{0}{0}\Rightarrow\frac{\frac{\sin^2 x}{\cos^2 x}-\frac{\cos^2 x}{\cos^2 x}}{\cos^2 x-\sin^2 x}\Rightarrow$$ (10

$\cos 2x = \cos^2 x-\sin^2 x$

$$\frac{-\cancel{(-\sin^2 x+\cos^2 x)}}{\cos^2 x\cancel{(\cos^2 x-\sin^2 x)}}=\frac{-1}{\cos^2 x}=\frac{-1}{\frac{1}{2}}=\boxed{-2}$$

$$\cos\frac{3\pi}{4}=-\frac{\sqrt{2}}{2}$$

ESPADANA